

Application Serial No. 10/585,289
Amendment after Final Rejection of February 13, 2009
Response to Office Action of October 30, 2008

REMARKS/ARGUMENTS

The Applicant responds under 37 C.F.R. § 1.116 to the Office Action of October 30, 2008.

Claims 1 through 24 are pending in the application. No claims are amended with this response.

No fee is due.

1. Rejection of Claims 1 through 5, 12, and 17 through 24 under 35 U.S.C. § 102(b)

The Examiner rejects Claims 1 through 5, 12, and 17 through 24 under 35 U.S.C. § 102(b) as being anticipated by JP 2000-272040 (“the ‘040 document”). The Applicant respectfully traverses this rejection and requests reconsideration.

The prior art does not disclose a fiber bundle that is stranded together by two types of fibers as claimed by the Applicant. The composite material of claim 1 of the present invention includes a fiber having a main constitutional fibers and auxiliary fibers. The auxiliary fibers have characteristics that compensate for changed characteristics of the main constitutional fibers when the main constitutional fibers are exposed to a high temperature atmosphere. This desirable result is because *the main constitutional fibers and auxiliary fibers are stranded together*.

The residual stress of a difference in thermal elongation between the fiber bundles and the matrix phase, when the composite material is exposed to a high temperature atmosphere, can be small. This feature of the invention can prevent microscopic breaking and damage such as

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cracks in the matrix phase due to the residual stress of difference in thermal elongation between the fiber bundles and the matrix phase.

The rejection states:

The Japanese reference discloses a fiber reinforced composite comprising a fiber fabric that comprises heat resistant textiles or fiber bundle with a polymer matrix adhered to the fabric (see reference claim 4). Additionally, the reference discloses that the fiber bundle comprises glass (silicon oxide) fiber and carbon fiber to form a bundle as per instant claims 1 through 5 (see paragraph 0007). The reference discloses that the matrix adhered to the fabric increases interlaminar strength.

However, this feature of the present invention discussed above is not disclosed or suggested in the '040 document. The '040 document states:

PROBLEM TO BE SOLVED: To produce a fiber reinforced composite material excellent in strength characteristics and thermal characteristics in low production cost.

SOLUTION: A ceramic precursor polymer is bonded to the surfaces of the fibers 10 of a fiber fabric comprising fibers or fiber bundles high in heat resistance and the fiber fabric to which the ceramic precursor polymer is bonded is heat-treated to grow ceramic whiskers 14 on the surfaces of the fiber bundles or fibers in the fiber fabric at random and, subsequently, a matrix 18 is formed to the interior and surface of the fiber fabric.

The Applicant maintains that the disclosure of the '040 document does not support the suggested meaning proposed in the rejection.

The sentence "a fiber textile formed of a fiber or a fiber bundle of *any one of ceramic fiber, carbon fiber and glass fiber*" from paragraph [0007] is not "a fiber textile formed of a fiber or a fiber bundle *which is stranded together by two types of fibers selected from ceramic fiber, carbon fiber and glass fiber*" This difference is because the '040 document neither

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discloses nor suggests that a fiber bundle is stranded together by two types of fibers. In the fiber textile in the '040 document, the residual stress of a difference in thermal elongation between the fiber bundles and the matrix phase when the composite material is exposed to a high temperature atmosphere is not considered. Therefore, since the residual stress of a difference in thermal elongation between the fiber bundles and the matrix phase, when the composite material is exposed to a high temperature atmosphere, cannot be small, breaking and damage such as cracks in the matrix phase due to the residual stress of difference in thermal elongation between the fiber bundles and the matrix phase cannot be prevented microscopically.

As has been explained in the above, the composite material of claim 1 and production method of claim 12 for a composite material include features which are neither disclosed nor suggested in the '040 document and result in reliably achieving the object of the present application. Accordingly, the Applicant requests that claims 1 and 12 with their dependent claims should be allowed.

2. Rejection of Claims 1 through 8, 10 through 13, and 16 through 24 under 35 U.S.C. § 103(a)

The Examiner rejects Claims 1 through 8, 10 through 13, and 16 through 24 under 35 U.S.C. § 103(a) as being obvious over JP 10-194856 in view of JP 2000-272040. The Applicant respectfully traverses this rejection and requests reconsideration. The applicant incorporates by reference the arguments presented above in its response to this rejection.

The Japanese 10-194856 document, in all the figures and specifically Figure 4, shows full separation between low elasticity fibers 4 and high elasticity fibers 3. This separation is with

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both types of fibers being separately adhered to the matrix with a spacing therebetween in an alternating matrix configuration. The Japanese '856 document discloses the fiber fabric being formed in a reticular pattern with two types of fiber bundles but not with the fiber bundles being "stranded" together as required in the present claims 1 and 12.

For this reason, the Japanese reference does not disclose all the features of the presently claimed invention and does not render obvious the present invention. In addition, there is no suggestion in the Japanese reference of providing the fibers in a stranded configuration and one skilled in the art would not have modified the fiber fabric of the Japanese reference to that of the presently claimed invention especially since the reference itself discloses that the structure with separated low and high elastic fibers having increased crack resistance.

The Applicant requests that claims 1 and 12 with their dependent claims should be allowed over this rejection.

3. Rejection of Claim 9 under 35 U.S.C. § 103(a)

The Examiner rejects Claim 9 under 35 U.S.C. § 103(a) as being obvious over JP 10-194856 in view of JP 2000-272040 and in further view of U.S. Patent Number 6,838,162 to Grueber et al. The Applicant respectfully traverses this rejection and requests reconsideration. The applicant incorporates by reference the arguments presented above in its response to this rejection.

The desirable features of claim 9 are not made obvious by the cited art because the two primary Japanese documents do teach one of ordinary skill the recited elements of claim 1 as

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explained above. The Applicant believes that this claim is independently patentable and requests that the rejection be withdrawn.

4. Rejection of Claims 14 and 15 under 35 U.S.C. § 103(a)

The Examiner rejects Claim 9 under 35 U.S.C. § 103(a) as being obvious over JP 10-194856 in view of JP 2000-272040 and in further view of U.S. Patent Number 6,723,382 to Yamaguchi et al. The Applicant respectfully traverses this rejection and requests reconsideration. The applicant incorporates by reference the arguments presented above in its response to this rejection.

The desirable features of claims 14 and 15 are not made obvious by the cited art because the two primary Japanese documents do teach one of ordinary skill the recited elements of claim 12 as explained above. The Applicant believes that these claims are independently patentable and requests that the rejection be withdrawn.

5. Conclusion

Favorable consideration and allowance of the application are requested.

Respectfully submitted,


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